



IPA Operations, Inc.  
108 National Street  
Milford, MA 01757  
Telephone (508) 482-7400  
Facsimile (508) 634-4021  
www.ipplc.com

Milford Power, LP

*Certified Mail*

Mr. Giles Steele-Perkins  
Massachusetts DEP  
627 Main Street  
Worcester, Massachusetts 01608

November 15, 2007  
HSE-07-M024

Re: Sewer Connection Permit Renewal Proposal

Dear Mr. Steele-Perkins,

Milford Power LP (Milford Power) has prepared this letter to formally submit two requests: 1) to make the four changes to Attachment A of the Sewer Extension Permit (SEP), Permit # W027308, (see below) and 2) to allow the SEP to lapse while moving its conditions to the renewed Sewer Connection Permit (SCP), (Current Permit # W026546). Milford Power has no proposal to change Attachment B of the current SEP except to transfer it to the renewed SCP.

We believe that using one permit for all of the relevant conditions will simplify the process for the Massachusetts Department of Environmental Protection (MADEP) as well as Milford Power. The goal of this letter is to outline the process by which Milford Power proposes to streamline this permit renewal.

Milford Power proposes the following tasks to meet this goal:

- Submit this letter outlining the process to MADEP as well as changes to Attachment A (see 'Proposed Modifications to Attachment A' below) of the current SEP for your review and approval; and
- Upon written (i.e., a letter or e-mail) approval of this letter's request, submit a renewal application for the SCP to MADEP using the forms and attachments described below.

The proposed SCP permit renewal package will include the following items:

- 1) Completed MADEP Transmittal Form for Permit Application and Payment (tr-formw.doc - rev 1/07).
- 2) Completed MADEP BWP IW 38 and BWP IW 39 Permit for Industrial Sewer User form (iw3839ap.doc - 7/07), Toxic Pollutants Form (iwtxperm - 7/07), and a two page supplement containing explanatory notes with two tables summarizing the monitoring data collected the past 3 years (August 2004 through July 2007).



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- 3) The existing attachments to the SCP including Attachment 1, MPLP Effluent Quality Monitoring Plan, Attachment 2, TDS Response Plan, and Attachment 3, Notification Plan. (No changes are proposed for these attachments.)
- 4) ~~The proposed attachments to the SCP (to be transferred from the existing SEP) including Attachment A, Impact Monitoring and Mitigation Plan, and Attachment B, Special Conditions (Low Flow Response Plan). The proposed modifications to Attachment A will be shown in redline strikeout for your approval. Milford Power will request no changes in Attachment B.~~

**Proposed Modifications to Attachment A (see draft enclosed copy with redline strikeout):**

The following summarizes our rationale for the four proposed changes to Attachment A of the current SEP (to be transferred to the renewed SCP):

- Elimination of meteorological data collection as outlined in Section 1.1.2 of Attachment A. The meteorological monitoring station was initially established when there were few readily available sources of such data in the area. The data are not used by Milford Power or by MADEP to assess compliance or to control the plant. Maintenance of the weather station represents a real expense to Milford Power (i.e., several thousand dollars each year).

There are currently several nearby sources of weather data including those that are accessible through the web. For example, at [www.weatherunderground.com](http://www.weatherunderground.com), three real time weather stations are available in Milford. Each of these stations has historical records available. Such stations are also available in the nearby towns of Hopkinton, Mendon, Bellingham, and Franklin. In addition, more formal data records are available for relatively low cost from commercial services such as [www.weatherbug.com](http://www.weatherbug.com).

We believe that this expenditure is no longer reasonable given the availability of the same quality data from other sources.



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- Elimination of the wetlands monitoring provisions as outlined in Sections 1.2 and 1.3 of Attachment A. Two rounds of sampling in the fifth year of the current SEP permit were required by Attachment A. As noted in the enclosed memorandum (from ENSR to MPLP dated 09-21-2007 titled "Charles River Monitoring Program-2007 Wetlands Vegetation and Soil Monitoring Results"), we believe strongly that the wetland soils and vegetative communities below the point of effluent diversion have been stable since the beginning of the Charles River Monitoring Program and that there is no evidence of adverse impact from the diversion. For this reason, we request that no additional monitoring of either the wetlands vegetation or soils be required under the future Charles River Monitoring Program.
- Elimination of the need for routine third party monitoring and reporting of stream flow as described in Section 1.5 of Attachment A. It is a common practice for regulated entities to monitor and report on their own compliance status. Milford Power wishes to have the flexibility to reduce its costs by performing this routine monitoring itself without the services of a contractor. Specifically, the monthly reporting on stream flow at the stream gage located downstream of the Milford Wastewater Treatment Plant, that currently takes the form of a letter from ENSR, may be taken over by Milford Power. This report would include graphic presentation of the data as well as evaluation of withdrawals relative to the diversion threshold of 3.06 cubic feet per second (cfs). Milford Power anticipates that specialty work such as confirmation of the stage-discharge relationship during low flow conditions, resurvey of the topographic points around the gage, and confirmation by USGS staff of stream flow measurement techniques would continue to be by a USGS-approved contractor to Milford Power.
- Elimination of the need to update the Quality Assurance and Control Plan (Section 1.6 of Attachment A). The current Quality Assurance and Control Plan include all activities that might be pursued under the new permit. Given this, we do not believe the effort to amend the plan for MADEP review is worthwhile. The scope of the plan going forward will be defined in the new permit and the specific procedures defined in the existing Quality Assurance Plan.



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As noted above, Milford Power would like your feedback on the application process relative to the SEP prior to submitting applications to renew either the SEP or SCP. Materials relevant to the Charles River Monitoring Plan have also been submitted with this letter and we believe that they will be sufficient to justify our proposed changes. We look forward to your comments on both aspects of this letter so that we can move forward with the permit renewal process. Thank you for your attention to these matters.

If you have any questions or comments pertaining to the above, please be sure to contact me at the above letterhead address, on telephone number of (774) 696-3906, or electronically at [rmaggiani@anpower.com](mailto:rmaggiani@anpower.com).

Sincerely,

A handwritten signature in cursive script that reads "Robert K. Maggiani". The signature is written in dark ink and is positioned above a horizontal line.

Robert K. Maggiani  
Corporate Environmental Manager

Encl. (2)

cc: IPA; Mr. S. Coughlin, Mr. S. Lavallee, Mr. M. Volpe, File  
ENSR; Mr. M. Gerath, Mr. J. Jolley  
DEP; Mr. A. Screpetis  
CRWA; Mr. N. Pickering

2003 PERMIT

Re: MILFORD - IWW  
Milford Power Limited Partnership  
Sewer Extension Force Main Permit Renewal #W027308  
Attachment "A"

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## ATTACHMENT "A"

### Impact Monitoring and Mitigation Plan

The permittee shall perform the monitoring and mitigation plan set forth below and in accordance with the directives of the Department of Environmental Protection (the Department). All monitoring shall be performed in accordance with a Quality Assurance Project Plan (QAPP), which has been approved by the Department as required in Section 1.6 of this attachment.

#### 1.0 Introduction

The Impact Monitoring and Mitigation Plan (the "Plan") will continue to track environmental and hydrologic conditions in and adjacent to the Charles River in the vicinity of the Milford Wastewater Treatment Plant (MWWTP) while treated wastewater is diverted for use at the Milford Power Limited Partnership (MPLP) Milford Facility. The plan will establish a technical basis by which the Department can determine whether or not the diversion of wastewater results in degradation in the river's wetland resources. The plan will also act as a compliance and enforcement tool to insure that a flow rate of 3.0 cfs, is maintained in the Charles River immediately downstream of the MWWTP and that appropriate mitigation measures are implemented immediately if impacts are identified. The monitoring component of the plan shall be conducted for the period of time set forth in Section 1.4 within the study area defined in Section 1.2. The monitoring plan itself is set forth in Section 1.3 and the mitigation plan is in Section 2.0.

#### 1.1 Hydrology and Climate

##### 1.1.1 Streamflow Monitoring

A secured river stage monitoring station shall be maintained upstream of the South Howard Street crossing of the Charles River. The monitoring station shall include a river level stage sensor with continual chart recorder (Stevens Type F or equivalent) placed in a stilling well that is hydraulically connected to the stream's low flow channel. The stage-discharge relationship that has been developed at this location shall be checked for accuracy monthly as set forth in the Quality Assurance Project Plan. This will allow for the conversion of measured river stage to river discharge rate. Data developed by the stream gage will be used to: 1) monitor compliance with the maintenance of 3.0 cfs downstream of MWWTP; 2) facilitate the implementation of the permittee's low river flow response and mitigation plan; and 3) develop statistics of river discharge. Quality Assurance/Quality Control verification flow measurements must be obtained at an approved USGS gage with established and stable ratings every two years in order to evaluate the accuracy of equipment and measurement technique employed as part of this plan.

3.06

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Within 120 calendar days of the effective date of this permit, the identification of the location of that selected USGS gage site must be submitted to the Department's Division of Watershed Management located at 627 Main Street in Worcester, MA 01608. ✓

### ~~1.1.2 Meteorological Monitoring~~

~~A weather monitoring station shall be operated on the Milford Power National Street site to simultaneously record weather conditions during the monitoring period. At a minimum, hourly wet and dry bulb temperature, relative humidity, wind speed and direction, and precipitation shall be recorded. Data shall be made available electronically via Excel spreadsheet upon request.~~

### ~~1.2 Monitoring Reaches~~

~~Two monitoring reaches previously established under sewer extension permit #24633, one upstream of the MWWTP and one downstream, shall constitute the study area. Within each reach, one permanent transect has been established which extends perpendicular to the river centerline and from upland to upland. Wetland vegetation analysis and soil characterizations shall be performed along these transects. The locations and brief descriptions of the previously established and referenced monitoring reaches are set forth below:~~

~~Reach 1: From Howard Street downstream to the MWWTP. This reach includes a sedge marsh with areas of hydrophilic grasses and cattails, and will serve as a control for Reach 3 with regard to the wetlands monitoring.~~

~~Reach 3: From Mellen Street downstream to the Conrail crossing. This area includes a sedge marsh, with some areas of hydrophilic grasses and cattails, and will permit the observation of immediate downstream impacts to a wetland system very similar to the wetland in Reach 1.~~

### ~~1.3 Monitoring Activities~~

~~The monitoring plan will permit the documentation of any changes in hydrological resources in the study area.~~

#### ~~1.3.1 Collection of Data from Wetland Vegetative Communities~~

~~Analysis of wetland plant community composition and structure shall be conducted at two transect locations within the reaches described in Section 1.2. Quantitative measurements shall be conducted at each reach. The wetland transect within Reach 3 will allow for the~~

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most direct assessment of impacts through comparison with a control transect within Reach 1. At transects within Reaches 1 and 3, two quadrants shall be located for the observation of woody vegetation. The quadrants will be 5m x 5m, and located at the wetland boundary and mid-wetland. The data collected from each quadrant shall include a list of plant species present, a stem count for all woody vegetation, and the percent cover of each species.

The documentation of herbaceous wetland species shall be conducted in 40 cm by 40 cm quadrants located along the two transects. Three 40 cm by 40 cm quadrants shall be located within each of the woody vegetation plots. A total of 12 quadrants (40x40 cm) for the study of herbaceous wetland vegetation shall be monitored. Information gathered from each quadrant shall include a list of the species present, the number of woody stems, and the percent cover of each species. In addition to manual verification, photographic documentation of all quadrants (woody and herbaceous) shall be made. Wetland plant community composition will be monitored at each plot two times during the growing season (early June, and mid-August) on the final year of the permit cycle.

#### **1.3.2. Collection of Data from Wetland Soils**

The soils adjacent to each woody vegetation plot shall be characterized. A profile analysis of the type and depth of wetland soils shall be conducted during the mid-August wetland plant monitoring.

#### **1.3.3 Data Analysis**

Analysis of the wetland communities in the study area shall be conducted based on the wetlands data collected. The analysis must contain, at a minimum, the following elements:

- (a) transect maps indicating the location of wetland boundaries and extent and nature of wetland plant communities along sampling transects;
- (b) calculation of importance values of each wetland species observed in the study quadrants; and
- (c) statistical analysis of plant community composition.

These results shall ultimately enable the identification of changes in the range, community composition and structure of herbaceous and woody vegetation present in each quadrant, as well as the introduction or loss of species in each quadrant over the duration of the study. These results shall be analyzed in relation to the presence or absence of such changes in both the control and downstream communities.

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Attachment "A"

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#### 1.4 Duration of Monitoring Plan

The monitoring required pursuant to this permit shall be conducted for the duration of the permit. Monitoring may be extended, altered or decreased, by modification or renewal of this permit.

#### ~~1.5 Independent Monitoring~~

~~Only a third-party environmental consulting firm that has been approved by the Department's Division of Watershed Management shall perform all monitoring and analyses required by the conditions of this permit. It is suggested that the firm be retained for the duration of the required monitoring plan.~~

#### 1.6 Quality Assurance and Control Plan

All monitoring, analysis, and reporting shall be conducted in accordance with a Quality Assurance and Control Plan approved by the Department. A revised Quality Assurance and Control Plan must be submitted for review to the Department's Division of Watershed Management located at 627 Main Street in Worcester, MA 01608 with sixty calendar days of the effective date of the subject permit # W027308. ✓

#### 2.0 Operational Conditions and Mitigation Measures

The permittee shall continue to implement its Charles River Low Flow Response Plan ("Low Flow Response Plan") developed pursuant to the prior Sewer Extension Permit #24633 which describes the operational adjustments which will be employed in the event that the river level stage sensor indicates that the river flow rate downstream of the MWWTP is approaching 3.0 cfs. This plan shall ensure that the diversion of MWWTP effluent shall cease prior to the river flow rate downstream of the MWWTP reaching 3.0 cfs. Effluent may be supplemented or replaced with water that has been stored on site, from the Milford Water Company, or from another private source.

All wastewater diversion from the treated effluent of the MWWTP to the Upper Charles River that is controlled by the permittee shall be ceased at any time the Upper Charles River flow rate reaches 3.0cfs. As its effort to comply with this requirement, the permittee may choose to restrict its diversion of treated effluent from the MWWTP to the Upper Charles River at Upper Charles River flow rates greater than 3.0cfs.



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The Department, as a result of the implementation of this plan, may determine a more protective river flow rate. Comparisons will be made between the streamflow gage located downstream of the MWWTP, and the Dover streamflow gage, in order to re-evaluate 3.0 cfs. In the event that a higher number is selected, it shall be incorporated into the permit through a permit modification.

~~The permittee shall immediately cease using diverted MWWTP effluent upon receipt of written notification that the Department has determined that an adverse impact on water quality, aquatic biota, or riverine wetlands is occurring in or near the river as a result of the diversion. Determinations of adverse impacts and causation thereof pursuant to this section may be made by the Department on its own initiative or in consultation with the Impact Evaluation Committee (IEC).~~

### **3.0 Impact Evaluation Committee**

The Impact Evaluation Committee (IEC) shall consist of five members; one representative of the Town of Milford, one representative of the permittee, one representative of the Charles River Watershed Association (CRWA), a representative from the MDFW, and a chairperson, approved by the Department. The IEC may meet as necessary.

### **4.0 Data Reporting and Availability**

All data collected by the permittee shall be sent to the Department and the IEC in accordance with the following schedule:

~~Hydrology and Climate~~ - by the 15th of the month, for previous months' data

Steam Gage Confirmation Measurements - annually, on or before March 1<sup>st</sup> for the previous years data

~~Wetland Vegetative Communities~~ - by December 1<sup>st</sup> during the last year of the permit cycle

~~Wetland Soils~~ - by December 1<sup>st</sup> during the last year of the permit cycle

All data and the annual report shall be sent to the Department's Central Region Office Bureau of Waste Prevention, the Department's Division of Watershed Management in Worcester, and the IEC. In addition, the annual reports which analyze all of the previous years' data shall also be sent to: the Department, the MDFW, the Energy Facilities Siting Council, the IEC, and the Conservation Commissions in the towns of Milford, Hopedale, and Bellingham. These reports are due by March 1st of each year.

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### 5.0 Enforceability

The conditions and requirements set forth above are hereby determined to be Special Conditions of this permit #W027308 and are hereby incorporated into this permit as enforceable conditions and restrictions. Non-compliance therewith is actionable by the Department as a violation of this permit.

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Attachment "B"

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### ATTACHMENT "B"

- 1) This permit shall expire five (5) years from the date of issuance of this permit. The permittee shall apply for a renewal of this permit 90 days prior to the expiration date of this permit in accordance with 314 CMR 7.09(3)(h)
- 2) By its cover letter dated October 14, 1992, the permittee submitted to the Department a Charles River Low Flow Response Plan ("Low Flow Response Plan") that established the permittee's wastewater diversion control reactions to decreasing flow levels in the Charles river as measured at a stream gauging station located just upstream of the South Howard Street railroad crossing in Milford, MA. By its letter dated February 22, 1993, the Department approved the Low Flow Response Plan, aka, the River Flow Plan. The elements of that Low Flow Response Plan and the Department's approval are hereby incorporated as a special condition of this permit by reference.
- 3) The conditions and requirements set forth above are Special Conditions imposed on the wastewater sewer extension permit # 133962. Non-compliance therewith is actionable by the Department as a violation of that permit.

ENSR  
2 Technology Park Drive, Westford, Massachusetts, 01886-3140  
T 978.589.3000 F 978.589.3100 www.ensr.aecom.com

## Memorandum

Date: September 21, 2007

To: Robert Maggiani, Mike Volpe, International Power America, Inc.

From: Dré Desilets, ENSR

Subject: Charles River Monitoring Program – 2007  
Wetlands Vegetation and Soil Monitoring Results

Distribution: M. Gerath, ENSR

Wetlands vegetation and soils monitoring was conducted in accordance with Section 3.4 of the Quality Assurance Project Plan (ENSR, 1998 as amended in 2003) for the Charles River Monitoring Program and "Attachment A" of the Sewer Extension Permit Renewal #027308 (April 3, 2003). Wetlands vegetation monitoring was conducted on June 6, 2007 and again on August 20, 2007 in conjunction with wetlands soil monitoring. Due to the fact that an access agreement could not be negotiated with the new property owners at 31 Howard Street, the location of the upstream background transect (Transect 1), the 2007 monitoring event was conducted only at the downstream transect (Transect 3).

### Wetlands Vegetation

#### Field Procedures

ENSR completed the 2007 vegetation field surveys during June and August at the one downstream belt transect location required by MADEP Permit (Transect 3). Two quadrants were located at previously monitored (i.e., 2002 and before) locations along this transect. These 5 meter by 5 meter quadrants were established along the transect at the wetland boundary and mid-wetland. The quadrants were marked with painted stakes and flagging tape. The data collected from each quadrant included a list of plant species present, and the percent cover of each species. Percent areal cover of each species was estimated using the Ocular Estimation of Cover Technique (Hays et al., 1981).

The documentation of herbaceous wetland species was conducted in three 40 cm by 40 cm subquadrants located within each of the woody vegetation quadrants. Information gathered from each quadrant included a list of plant species present, the number of woody stems, and the percent cover of each species.

#### Results

Percent areal cover of herbaceous plant species within defined quadrants at Transect 1 and Transect 3 was compared from monitoring events from 2000 through 2002, and 2007 (Transect 3 only). A MADEP-mandated monitoring methodology change occurred in 1998; between 1992 and 1997, all vegetative species in the transects were evaluated within 5 m<sup>2</sup> quadrants, while the protocol for 1998 and

## ENSR

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T 978 589.3000 F 978.589.3100 www.ensr.aecom.com

subsequent monitoring years called for the monitoring of woody vegetation over 5 m<sup>2</sup>, but monitoring of herbaceous species only within 30 cm by 30 cm subplots of the same 5 m<sup>2</sup> quadrants. This methodology change did not allow for direct comparison of herbaceous species data within years 1992-1997 to subsequent years. As such, data from 2000-2002 (and 2007 for Transect 3) are presented in Tables 1 and 2 for analysis of changes in areal percent cover, presence of wetland species and species diversity. Pre-diversion data from 1992 and 1993 and post-diversion data from 1996 and 1997 are presented in Tables 3 and 4 to allow for the comparison of percent of wetland species present within Transects 1 and 3 with 2000-2007 data.

Transect 3 experienced a slight increase in average percent areal herbaceous cover between 2000 and 2007 (Table 1). There was an increase in average herbaceous cover in Quadrant 1 and in the number of species identified. In Quadrant 2, average percent herbaceous cover fluctuated from 2000 to 2007 and the number of species identified increased. One herbaceous species (arrow arum, *Peltandra virginica*) exhibited an increase in Quadrant 2. Overall average cover remained compatible with pre-diversion data within the quadrant. In particular, the percentage of wetland species remains very high throughout the period.

The field data sheets from the vegetation surveys at Transect 3 are attached to this memorandum. Since the last vegetation monitoring event in 2002, minor changes in areal coverage of individual species were evident in all quadrats. Transect 3 Quadrant 1 demonstrated an increase in woody vegetation overstory. This dense canopy of smooth alder (*Alnus serrulata*), silky dogwood (*Cornus amomum*) and glossy buckthorn (*Rhamnus frangula*) is likely the cause in the observed decrease in areal cover of spotted jewelweed (*Impatiens capensis*) and Canada mayflower (*Maianthemum canadense*). Monitoring of Quadrant 2 in the herbaceous floodplain observed an increase in diversity of species. River sedge (*Carex lacustris*) continues to be the dominant species within Quadrant 2 and a increase in areal cover of purple loosestrife (*Lythrum salicaria*) was not observed between 2002 and 2007.

In the control transect (Transect 1), a slight decrease in average percent areal herbaceous cover in Quadrant 1 and no change in areal cover in Quadrant 2 was recorded between 2000 and 2002 (Table 2). As previously noted, no data was recorded for the 2007 monitoring effort. The decrease in areal percent cover in Quadrant 1 is due to one herbaceous species (sensitive fern, *Onoclea sensibilis*), whose decrease is attributed to the increase in canopy cover and overhanging woody vegetation.

Consistent with pre-diversion conditions, the species observed post-diversion ranged from Facultative (FAC) to Obligate Wetland (OBL). Facultative Wet (FACW) species were dominant at Transect 3, Quadrant 1 on average in pre-diversion (1992 and 1993) and post-diversion (2000-2007). At Transect 3, Quadrant 2, OBL species were dominant on average both pre- and post-diversion. *Carex lacustris*, which dominated the wetland community at Transect 3, Quadrant 2 pre-diversion, remains the dominant species through 2007.

The percentage of wetland species present within each transect and quadrant was calculated for pre- and post-diversion (Tables 1-4). For Transect 3, Quadrant 1, 75-100% of herbaceous species observed during pre-diversion (1992-1993) monitoring were wetland species compared to 67-100% during post-diversion (1996-2007) monitoring (data for 2007 indicated 86% and 100% wetland species). For Transect 3, Quadrant 2, 100% of herbaceous species observed during pre-diversion monitoring were wetland species compared to 89-100% during post-diversion monitoring (data from both 2007 rounds indicated 100% wetland species). Fluctuations were also observed within the control transect. For Transect 1, Quadrant 1, 70% of herbaceous species observed during pre-diversion (1992-1993) monitoring were wetland species compared to 38-71% during post-diversion (1996-2002) monitoring. For Transect 1, Quadrant 2, 83-86% of herbaceous species observed during pre-diversion monitoring were wetland species compared to 73-75% during post-diversion monitoring.

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T 978.589.3000 F 978.589.3100 www.ensr.aecom.com

Overall, these changes in the vegetated community were negligible. Percent covers of common vegetative species throughout the study area were generally consistent with areal covers exhibited in previous years and typical for northeastern palustrine wetlands. Although herbaceous wetlands vegetation is typically more sensitive than woody plant species to fluctuations in precipitation, the vegetative species observed in the herbaceous stratum in 2007 closely correspond to herbaceous species data of previous years, both in terms of percent cover and species composition.

At the request of Arthur Screpetis (MADEP), visual inspections of the presence of invasive species were made from the Howard Street bridge looking south along the Charles River floodplain (upstream transect). No invasive species, including *Lythrum salicaria*, were observed along the banks of the Charles River at the Howard Street crossing, however, the river at this location is not bounded by an herbaceous floodplain similar to the Transect 1 sampling locations. Further inspections along the floodplain south of the Howard Street crossing indicate that areal cover of *Lythrum salicaria* in the herbaceous floodplain within the vicinity of Transect 1 is approximately 5 to 25%.

**Wetlands Soils****Field Procedures**

Soils horizons were examined for morphologic features using a hand auger. The existing soil horizons are characterized and described on data sheets attached to this memorandum. Descriptions of soil profiles were conducted in accordance with methods and requirements outlined in the Corps of Engineers Wetland delineation Manual (Environmental Laboratory, 1987) and taxonomic standards from Keys to Soil Taxonomy (U.S. Department of Agriculture, 1994). When observed in test pits, saturation levels and standing water were recorded.

**Results**

Overall, data obtained from soil borings in 2007 were consistent with soil compositions determined in 2001 and previous years of this monitoring program (see Tables 5 and 6). All borings conducted revealed the presence of hydric soils.

TABLE 1  
HERBACEOUS WETLAND SPECIES AVERAGE AREAL COVERAGE  
AT TRANSECT 3; 2000-2002, 2007

| Species                         | Regional Indicator | 2000 Q1 | 2001 Q1 | 2002 Q1 | 2007 Q1 | 2000 Q2 | 2001 Q2 | 2002 Q2 | 2007 Q2 |
|---------------------------------|--------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| <i>Acer rubrum</i>              | FAC                | 1-5%    |         |         |         |         |         |         |         |
| <i>Aster umbellatus</i>         | FACW               |         |         |         |         |         |         |         |         |
| <i>Bidens</i> sp.               |                    |         |         |         |         |         |         |         |         |
| <i>Boehmeria cylindrica</i>     | FACW+              |         |         |         |         |         |         | 1-5%    |         |
| <i>Calamagrostis canadensis</i> | FACW+              |         |         |         |         |         |         |         | <1%     |
| <i>Carex lacustris</i>          | OBL                |         |         |         |         | 1-5%    |         |         | 1-5%    |
| <i>Carex stricta</i>            | OBL                |         |         |         |         | 16-25%  | 26-50%  | 16-25%  | 16-25%  |
| <i>Cornus amomum</i>            | FACW               | 6-15%   |         | 6-15%   | 26-50%  | 16-25%  | 26-50%  | 51-75%  |         |
| <i>Gallium palustre</i>         | OBL                |         |         |         |         | 1-5%    |         |         |         |
| <i>Impatiens capensis</i>       | FACW               |         |         |         |         | 1-5%    | 1-5%    |         |         |
| <i>Lythrum salicaria</i>        | FACW+              |         |         | <1%     | <1%     | <1%     |         | <1%     |         |
| <i>Meibomia canadensis</i>      | FAC-               | 1-5%    | 1-5%    | 6-15%   |         | 16-25%  | 26-50%  | 16-25%  | 16-25%  |
| <i>Onoclea sensibilis</i>       | FACW               | 16-25%  | 1-5%    | 1-5%    | 6-15%   |         |         |         |         |
| <i>Osmunda cinnamomea</i>       | FACW               |         |         |         | 6-15%   |         |         |         |         |
| <i>Peltandra virginica</i>      | OBL                |         | 1-5%    |         | 6-15%   |         |         |         |         |
| <i>Polygonum arifolium</i>      | OBL                |         |         |         |         |         |         |         |         |
| <i>Rubus hispidus</i>           | FACW               | 1-5%    |         |         |         |         |         | 1-5%    | 16-25%  |
| <i>Scirpus cyperinus</i>        | FACW+              |         |         | 1-5%    |         |         |         | 1-5%    | 1-5%    |
| <i>Smilax rotundifolia</i>      | FAC                |         |         |         |         | 1-5%    |         |         |         |
| <i>Typha latifolia</i>          | OBL                |         |         |         | 1-5%    |         |         |         |         |
| <i>Viburnum recognitum</i>      | FACW+              |         |         | 26-50%  | 6-15%   |         |         |         | 1-5%    |
| Number of Species               |                    | 5       | 3       | 6       | 6       | 7       | 4       | 7       | 9       |
| Total Average % Areal Coverage  |                    | 26-50%  | 6-15%   | 26-50%  | 51-75%  | 51-75%  | >96%    | 76-95%  | 51-75%  |
| % Wetland Species Present       |                    | 80%     | 67%     | 86%     | 100%    | 100%    | 100%    | 100%    | 89%     |

Flooding reduced sampling effort in June of 2000 and 2001. Lower percentages may not reflect true conditions due to flooding. Average percent coverage presented in this table is the average of three sub-quadrants (30 cm<sup>2</sup>) from each quadrat. Percent coverage values presented in this table are not directly comparable to those recorded prior to 1998 (Table 3). Values prior to 1998 were based on a 5 m<sup>2</sup> quadrat. Percent wetland species present includes species with Regional Indicator of OBL, FACW+, FACW, FACW-, FACW+, or FAC. Species without an indicator status noted were not counted as wetland species.

**TABLE 2**  
**HERBACEOUS WETLAND SPECIES AVERAGE AREAL COVERAGE**  
**AT TRANSECT 1; 2000-2002**

| Species                               | Regional Indicator | 2000 Q1 | 2001 Q1 | 2002 Q1 | 2000 Q2 | 2001 Q2 | 2002 Q2 |
|---------------------------------------|--------------------|---------|---------|---------|---------|---------|---------|
| <i>Acalypha rhomboldea</i>            | FAC                | <1%     |         |         |         |         |         |
| <i>Acer rubrum</i>                    | FAC                |         |         |         |         |         |         |
| <i>Aster vimineus</i>                 | FAC                |         | <1%     |         |         |         |         |
| <i>Boehmeria cylindrica</i>           | FACW+              |         |         |         | <1%     | <1%     | <1%     |
| <i>Calamagrostis canadensis</i>       | FACW+              |         |         |         |         |         | 1-5%    |
| <i>Celastrus orbiculatus</i>          | UPL                | <1%     | <1%     |         | 51-75%  | 51-75%  | 51-75%  |
| <i>Cuscuta gronovii</i>               |                    | 1-5%    | 1-5%    | 16-25%  |         |         |         |
| <i>Gallium palustre</i>               | OBL                |         |         |         |         | <1%     |         |
| <i>Glyceria canadensis</i>            | OBL                | <1%     |         |         | <1%     | <1%     |         |
| <i>Impatiens capensis</i>             | FACW               | 6-15%   | 1-5%    | 1-5%    |         |         |         |
| <i>Leersia oryzoides</i>              | OBL                |         | <1%     |         |         |         |         |
| <i>Maianthemum canadense</i>          | FAC-               | 1-5%    | 1-5%    | 1-5%    |         |         |         |
| <i>Onoclea sensibilis</i>             | FACW               | 26-50%  | 6-15%   | 6-15%   |         |         |         |
| <i>Parthenocissus quinquefolia</i>    | FACU               | 6-15%   | 1-5%    | 1-5%    |         |         |         |
| <i>Pilea pumila</i>                   | FACW               | 1-5%    |         |         |         |         |         |
| <i>Polygonum sagittatum</i>           | OBL                |         |         |         |         |         |         |
| <i>Prunus serotina</i>                | FACU               |         |         |         |         | <1%     |         |
| <i>Rhamnus frangula</i>               | FAC                | <1%     | <1%     | 1-5%    |         |         |         |
| <i>Rubus idaeus</i>                   | FAC-               |         |         | 1-5%    |         |         |         |
| <i>Smilacina racemosa</i>             | FACU-              | 1-5%    | 1-5%    | 1-5%    | 1-5%    | 1-5%    | 1-5%    |
| <i>Solidago sp.</i>                   |                    | 1-5%    |         |         |         |         |         |
| <i>Symplocarpus foetidus</i>          | OBL                |         | 1-5%    | 1-5%    |         |         | 1-5%    |
| <i>Thalictrum pubescens</i>           | FACW+              | 6-15%   | 6-15%   | 16-25%  |         |         |         |
| <i>Toxicodendron radicans</i>         | FAC                | 1-5%    | 1-5%    |         |         |         |         |
| <i>Urtica sp.</i>                     |                    |         |         |         |         |         |         |
| <i>Viburnum recognitum</i>            | FACW-              | 1-5%    | <1%     | <1%     |         | <1%     |         |
| <b>Number of Species</b>              |                    | 15      | 14      | 11      | 4       | 7       | 5       |
| <b>Total Average % Areal Coverage</b> |                    | 76-95%  | 26-50%  | 26-50%  | 51-75%  | 51-75%  | 51-75%  |
| <b>% Wetland Species Present</b>      |                    | 67%     | 71%     | 55%     | 75%     | 57%     | 60%     |

Average percent coverage presented in this table is the average of three sub-quadrants (30 cm<sup>2</sup>) from each quadrant. Percent coverage values presented in this table are not directly comparable to those recorded prior to 1998 (Table 3). Values prior to 1998 were based on a 5 m<sup>2</sup> quadrant.

Percent wetland species present includes species with Regional Indicator of OBL, FACW+, FACW-, FACW+, or FAC. Species without an indicator status noted were not counted as wetland species.



TABLE 3  
HERBACEOUS WETLAND SPECIES AVERAGE AREAL COVERAGE AT TRANSECT 3 PRE- AND POST-DIVERSION

| Transect 3, Q1<br>Species         | Regional<br>Indicator | Average Percent Areal Coverage |        |                |
|-----------------------------------|-----------------------|--------------------------------|--------|----------------|
|                                   |                       | Pre-Diversion                  | 1993   | Post Diversion |
| <i>Acer rubrum</i>                | FAC                   |                                |        | 1997           |
| <i>Aster spp.</i>                 |                       |                                |        | <1%            |
| <i>Carex lacustris</i>            | OBL                   | <1%                            | <1%    | <1%            |
| <i>Cornus amomum</i>              | FACW                  | 1-5%                           | <1%    | 6-15%          |
| <i>Cuscuta gronovii</i>           | UPL                   |                                |        | <1%            |
| <i>Dryopteris marginalis</i>      | FACU-                 |                                |        | 1-5%           |
| <i>Gallium palustre</i>           | OBL                   |                                | <1%    | 1-5%           |
| <i>Hamamelis virginiana</i>       | FAC-                  | <1%                            |        | 1-5%           |
| <i>Impatiens capensis</i>         | FACW                  | 16-25%                         | 26-50% | 1-5%           |
| <i>Maianthemum canadense</i>      | FAC-                  |                                |        | 1-5%           |
| <i>Onoclea sensibilis</i>         | FACW                  | <1%                            | <1%    | 1-5%           |
| <i>Osmunda cinnamomea</i>         | FACW                  | <1%                            | <1%    | 1-5%           |
| <i>Peltandra virginica</i>        | OBL                   | 1-5%                           | 1-5%   | 6-15%          |
| <i>Polygonum sagittatum</i>       | FACW                  | <1%                            | <1%    | <1%            |
| <i>Rubus hispidus</i>             | OBL                   |                                |        | <1%            |
| <i>Sagittaria latifolia</i>       | FAC                   |                                |        | <1%            |
| <i>Solidago rugosa</i>            | OBL                   |                                |        | <1%            |
| <i>Sphagnum sp.</i>               | OBL                   |                                |        | 1-5%           |
| <i>Symlocarpus foetidus</i>       | OBL                   |                                |        | <1%            |
| <i>Thelypteris noveboracensis</i> | FAC                   |                                |        | <1%            |
| <i>Thelypteris thelypteroides</i> | FACW+                 |                                |        | <1%            |
| <i>Vaccinium corymbosum</i>       | FACW-                 |                                |        | <1%            |
| <i>Viburnum spp.</i>              |                       | 6-15%                          |        | 1-5%           |
| Number of Species                 |                       | 8                              | 7      | 17             |
| Total Average % Areal Coverage    |                       | 26-50%                         | 26-50% | 26-50%         |
| % Wetland Species Present         |                       | 75%                            | 100%   | 76%            |

Percent areal coverage values in each 5 m<sup>2</sup> quadrant for the sampling year were averaged.  
Percent wetland species present includes species with Regional Indicator of OBL, FACW-, FACW+, or FAC. Species without an indicator status noted were not counted as wetland species.

| Transect 3, Q2<br>Species       | Regional<br>Indicator | Average Percent Areal Coverage |        |                |
|---------------------------------|-----------------------|--------------------------------|--------|----------------|
|                                 |                       | Pre-Diversion                  | 1993   | Post Diversion |
| <i>Aster spp.</i>               | FAC                   |                                | <1%    | 1997           |
| <i>Calamagrostis canadensis</i> | FACW+                 |                                | <1%    | 1-5%           |
| <i>Carex lacustris</i>          | OBL                   | 76-95%                         | 76-95% | <1%            |
| <i>Carex stricta</i>            | OBL                   | <1%                            | 1-5%   | 76-95%         |
| <i>Boehrmia cylindrica</i>      | FACW                  |                                |        | 1-5%           |
| <i>Didiplis diandra</i>         | OBL                   |                                |        | <1%            |
| <i>Epilobium coloratum</i>      | OBL                   |                                | <1%    | <1%            |
| <i>Gallium palustre</i>         | OBL                   | 1-5%                           | 1-5%   | 1-5%           |
| <i>Impatiens capensis</i>       | FACW                  | 1-5%                           | 1-5%   | 6-15%          |
| <i>Lythrum salicaria</i>        | FACW+                 | <1%                            | <1%    | 1-5%           |
| <i>Poa palustris</i>            | FACW                  | <1%                            | <1%    | 1-5%           |
| <i>Polygonum sagittatum</i>     | OBL                   | <1%                            | 1-5%   | 1-5%           |
| <i>Sagittaria latifolia</i>     | OBL                   |                                | <1%    | <1%            |
| <i>Scirpus cyperinus</i>        | FACW+                 |                                |        | 1-5%           |
| <i>Sphagnum sp.</i>             | OBL                   |                                |        | <1%            |
| Number of Species               |                       | 6                              | 10     | 11             |
| Total Average % Areal Coverage  |                       | 76-95%                         | >96%   | >96%           |
| % Wetland Species Present       |                       | 100%                           | 100%   | 100%           |

TABLE 4  
HERBACEOUS WETLAND SPECIES AVERAGE AREAL COVERAGE AT TRANSECT 1 PRE- AND POST-DIVERSION

| Transect 1, Q1  |  | Regional Indicator | Average Percent Areal Coverage |                | Transect 1, Q2           |  | Regional Indicator | Average Percent Areal Coverage |                |
|---|--|--------------------|--------------------------------|----------------|--------------------------|--|--------------------|--------------------------------|----------------|
| Species   |  |                    | Pre-Diversion                  | Post Diversion | Species                  |  |                    | Pre-Diversion                  | Post Diversion |
| Carex sp.   |  |                    | 1992                           | 1993           | Aster simplex            |  | FACW               | 1992                           | 1993           |
| Celastrus sp.   |  |                    |                                |                | Calamagrostis canadensis |  | FACW+              | 1-5%                           | 6-15%          |
| Cornus amomum   |  | FACW               |                                |                | Carex stricta            |  | OBL                | 51-75%                         | 26-50%         |
| Cylindrica boehrnia   |  | FACW               |                                |                | Boehrmia cylindrica      |  | FACW               | 1-5%                           | 26-50%         |
| Dryopteris marginalis   |  | FACU-              |                                |                | Galium sp.               |  |                    |                                | 6-15%          |
| Impatiens capensis  |  | FACW               |                                |                | Impatiens capensis       |  | FACW               | <1%                            | <1%            |
| Lactuca sp.   |  |                    | 26-50%                         | 26-50%         | Onoclea sensibilis       |  | FACW               | <1%                            | <1%            |
| Maianthemum canadense   |  | FAC-               |                                |                | Phalaris arundinacea     |  | FACW+              | <1%                            | <1%            |
| Onoclea sensibilis  |  | FACW               |                                |                | Polygonum sagittatum     |  | OBL                | 16-25%                         | <1%            |
| Osmunda cinnamomea  |  | FACW               | 26-50%                         | 26-50%         | Rubus spp.               |  |                    |                                | 1-5%           |
| Parthenocissus quinquefolia   |  | FACU               |                                |                | Sambucus canadensis      |  | FACW-              | <1%                            | <1%            |
| Prunus serotina   |  | FACU               |                                |                | Solidago sp.             |  |                    | 1-5%                           | 1-5%           |
| Rhamnus frangula  |  | FAC                |                                |                | Sphagnum sp.             |  | OBL                |                                | <1%            |
| Rosa multiflora   |  | FACU               |                                |                | Spiraea latifolia        |  | FACW               | 1-5%                           | <1%            |
| Rubus sp.   |  |                    |                                |                | Urtica dioica            |  |                    |                                | <1%            |
| Sambucus canadensis   |  | FACW-              |                                |                |                          |  |                    |                                |                |
| Smilacina racemosa  |  | FACU-              | 1-5%                           | 6-15%          |                          |  |                    |                                |                |
| Solidago sp.  |  |                    | <1%                            | <1%            |                          |  |                    |                                |                |
| Sphagnum sp.  |  | OBL                | <1%                            | <1%            |                          |  |                    |                                |                |
| Streptopus amplexifolius  |  | FAC+               | <1%                            | <1%            |                          |  |                    |                                |                |
| Symplocarpus foetidus   |  | OBL                | <1%                            | <1%            |                          |  |                    |                                |                |
| Taraxacum officinale  |  | FACU-              | 1-5%                           | 1-5%           |                          |  |                    |                                |                |
| Thalictrum pubescens  |  | FACW+              | <1%                            | <1%            |                          |  |                    |                                |                |
| Toxicodendron radicans  |  | FAC                | <1%                            | <1%            |                          |  |                    |                                |                |
| Upland moss   |  | UPL                |                                |                |                          |  |                    |                                |                |
| Viburnum spp.   |  |                    |                                |                |                          |  |                    |                                |                |
| Uvularia sessilifolia   |  | FACU-              | 1-5%                           | 1-5%           |                          |  |                    |                                |                |
| Vitis sp.   |  |                    |                                |                |                          |  |                    |                                |                |
| Number of Species   |  |                    | 10                             |                |                          |  |                    |                                |                |
| Total Average % Areal Coverage  |  |                    | 76-95%                         | 70%            |                          |  |                    |                                |                |
| % Wetland Species Present   |  |                    | 70%                            | 70%            |                          |  |                    |                                |                |
| Percent areal coverage values in each 5 m <sup>2</sup> quadrat for the sampling year were averaged.                                   |  |                    |                                |                |                          |  |                    |                                |                |
| Percent wetland species present includes species with Regional Indicator of OBL, FACW+, FACW, FACW-, FAC+, or FAC. Species without an |  |                    |                                |                |                          |  |                    |                                |                |
| Indicator status noted were not counted as wetland species.   |  |                    |                                |                |                          |  |                    |                                |                |

TABLE 5  
SOIL PROFILE DESCRIPTION AT TRANSECT 3: 1992-2007

| Year | Q1 Horizon | Depth   | Color/Description  | Q2 Horizon | Depth   | Color/Description                           | Hydric soil? | Hydric soil? |
|------|------------|---------|--|------------|---------|---|--------------|--------------|
| 1992 | Oi         | 0-4"    | 10 YR 2/2  | Oi         | 0-2"    | 10 YR 3/2                                   | Yes          | Yes          |
|      | Oe         | 4-18"   | 10 YR 2/2  | Oe         | 2+"     | 10 YR 2/1 / standing water at 2" bgs        |              |              |
|      | Bw         | 18+"    | 2.5 Y 2/0 / mottle color of 10YR 5/2; no standing water at 18" |            |         |   |              |              |
| 1993 | Oi         | 0-4"    | 2.5 YR 2/2   | Oi         | 0-3"    | 10 YR 3/2 / saturated 1" bgs                | Yes          | Yes          |
|      | Oa         | 4-18"   | 10 YR 2/1 / water seep at 10"                                  | Oa         | 3-18+"  | 10 YR 2/1                                   |              |              |
|      | C          | 18+"    | 10 YR 3/2 / fine sandy loam                                    |            |         |   |              |              |
| 1996 | Oi         | 0-2"    | 10 YR 2/2 / fibric; standing water at 1.5" bgs                 | Oe         | 0-5"    | 10 YR 3/2 / hemic; standing water at 1" bgs | Yes          | Yes          |
|      | Oe         | 2-6"    | 10 YR 2/1 / hemic  |            |         |   |              |              |
|      | Oa         | 6-18"   | 7.5 YR 3/0 / sapric  | A1         | 5-9"    | 10 YR 4/1 / silt loam                       |              |              |
|      | A1         | 18-24"  | 10 YR 4/2 / sapric   | Ab         | 9-23"   | 7.5 YR 3/0 ; clay silt                      |              |              |
|      | C1         | 24-32"  | 10 YR 7/2 / fine sand  | C1         | 23-37"  | 7.5 YR 3/0, 10 YR 5/1 / silt loam           |              |              |
| 1997 | Oi         | 2-0"    | N/A / fibric   | Cg2        | 37-40"  | 10 YR 5/1 / sandy clay                      |              |              |
|      | Oe         | 2-6"    | 10 YR 2/1 / hemic  | Oi         | 2-0"    | 10 YR 3/2 / fibric                          |              |              |
|      | Oa         | 6-16"   | 7.5 YR 3/0 / sapric  | Oe         | 0-5"    | 10 YR 4/1 / hemic                           |              |              |
|      | A1         | 16-26"  | 10 YR 4/2 / sapric   | Oa         | 5-30"   | 7.5 YR 3/0 / sapric                         |              |              |
|      | C1         | 26-34+" | 10 YR 7/2 / fine sand  | C1         | 30-33+" | 7.5 YR 3/0, 10 YR 5/1 / silt loam           |              |              |
| 1999 | Oi         | 1-0"    | N/A / fibric   |            |         | 50/50 streaking (with gleying)              | Yes          | Yes          |
|      | Oe         | 0-7"    | 10 YR 2/2 / hemic  | Oi         | 1-0"    | 10 YR 3/2 / fibric                          |              |              |
|      | Oa         | 7-25"   | 10 YR 2/1 / sapric   | Oe         | 0-2"    | 10 YR 4/1 / hemic                           |              |              |
|      | Cg1        | 25+"    | 10 YR 7/2 / medium sand  | Oa         | 2-29"   | 10 YR 2/1 / sapric                          |              |              |
| 2001 | Oi         | 1-0"    | N/A / fibric   | Cg1        | 29+"    | 10 YR 5/1 / sandy loam                      | Yes          | Yes          |
|      | Oe         | 0-7"    | 10 YR 2/1 / fibric; saturated at 2" bgs                        | Oi         | 1-0"    | N/A / fibric; standing water at 1" bgs      |              |              |
|      | Oa         | 7-25"   | 10 YR 2/1 / sapric   | Oe         | 0-2"    | 10 YR 4/1 / hemic                           |              |              |
|      | Cg1        | 25+"    | 7/10Y / very fine sand   | Oa         | 2-26"   | >10 YR 2/1 / sapric                         | Yes          | Yes          |
| 2007 | Oi         | 1-0"    | N/A / fibric   | C          | 26+"    | 10 YR 3/2 / sandy loam                      |              |              |
|      | Oe         | 0-7"    | 10 YR 2/1 / hemic  | Oi         | 1.5-0"  | N/A / fibric; saturated at surface          |              |              |
|      | Oa         | 7-24"   | 10 YR 2/1 / sapric   | Oe         | 0-2"    | 10 YR 4/1 / hemic                           | Yes          | Yes          |
|      | Cg1        | 24+"    | 10 YR 7/2 / fine sand; oxidized rhizospheres                   | Oa         | 2-28"   | >10 YR 2/1 / sapric                         |              |              |
|      |            |         | Highlighted cells indicate hydric soils.                       | C          | 28+"    | 10 YR 3/2 / fine sandy loam                 |              |              |

**TABLE 6**  
**SOIL PROFILE DESCRIPTION AT TRANSECT 1; 1992-2001**

| Year | Q1 Horizon | Depth   | Color/Description  | Hydric soil? | Q2 Horizon | Depth   | Color/Description                            | Hydric soil? |
|------|------------|---------|--|--------------|------------|---------|--|--------------|
| 1992 | Oe         | 0-2"    | 5 YR 3/2 / sandy loam  | Yes          | No data    |         |  |              |
|      | Ap         | 2-5"    | 5 YR 3/1 / sandy loam  |              |            |         |  |              |
|      | B          | 5-10"   | 7.5 YR 3/3 / sandy loam  |              |            |         |  |              |
|      | C1         | 10-15"  | 7.5 YR 4/3 / sandy loam  |              |            |         |  |              |
|      | C2         | 15-24"  | 7.5 YR 2/0 / sandy loam; no standing water at 24"                          |              |            |         |  |              |
| 1993 | Oe         | 0-3"    | 10 YR 3/2 / loamy sand; mottles are 10R 3/4 c/m/d                          | Yes          | Oa<br>C    | 0-15"   | 5 YR 2/1; water seep at 6"                   | Yes          |
|      | A          | 3-12"   | 10 YR 5/2 / fine sand; mottles are 10R 4/4 c/m/d                           |              |            | 15+"    | 10 YR 3/2 / silt loam; standing water at 24" |              |
|      | C          | 12-13"  | 10 YR 2/2 / loamy sand; mottles are 2.5YR 3/4 c/m/d; standing water at 23" |              |            |         |  |              |
|      | 2C         | 13-25+" | N/A  |              |            |         |  |              |
| 1996 | Oi         | 1-0"    | 10 YR 2/2 / fine sandy loam  | Yes          | Oi         | 1-0"    | saturated to surface, no standing water      | Yes          |
|      | Oa         | 0-3"    | 10 YR 3/2 / fine sandy loam; mottles are 10 YR 4/6 faint                   |              |            |         |  |              |
|      | A1         | 3-14"   | 7.5 YR 2/0 / silt, some clay   |              |            | 0-2"    | 10 YR 2/1 / hemic                            |              |
|      | Ab         | 14-29"  | 10 YR 6/2 / silty sand   |              |            | 2-25"   | 7.5 YR 2/0 / sapric                          |              |
|      | C1         | 29+"    | N/A  |              |            |         |  |              |
| 1997 | Oi         | 1-0"    | 10 YR 2/2 / fine sandy loam  | Yes          | Oi         | 25-30+" | 10 YR 3/2 / silty clay                       |              |
|      | Oa         | 0-5"    | 10 YR 3/2 / fine sandy loam  |              |            | 1-0"    | N/A  |              |
|      | A1         | 5-18"   | 7.5 YR 2/0 / sandy silt  |              |            | 0-4"    | 10 YR 2/1 / hemic                            |              |
|      | Ab         | 18-23"  | N/A / fibric   |              |            | 4-21"   | 7.5 YR 2/0 / sapric                          |              |
|      | Oi         | 1-0"    | 10 YR 3/2 / fine sandy loam; mottles are 7.5Y 4/6 faint/few                |              |            | 21-23+" | 10 YR 3/2 / silty clay                       |              |
| 1999 | Oa         | 0-4"    | 7.5 YR 2/0 / fine sand   | Yes          | Oi         | 1-0"    | N/A / fibric                                 | Yes          |
|      | A1         | 4-17"   | N/A  |              |            | 0-4"    | 10 YR 2/2 / hemic                            |              |
|      | Ab         | 17-24+" | 10 YR 3/2 / very fine sandy loam   |              |            | 4-21"   | 10 YR 2/1 / sapric                           |              |
|      | N/A        | 0.5-0"  | 10 YR 3/1 / very fine sandy loam   |              |            |         |  |              |
|      | A1         | 0-9"    | 2.5Y/10Y / silt loam   |              |            |         |  |              |
| 2001 | A2         | 9-12"   | 10 YR 4/1 / coarse & medium sand   | Yes          | Oi         | 1-0"    | N/A / fibric                                 | Yes          |
|      | B          | 12-21"  |  |              |            | 0-4"    | 10 YR 2/2 / hemic                            |              |
|      | Cg1        | 21+"    |  |              |            | 4-26+"  | 10 YR 2/1 / sapric                           |              |
|      |            |         |  |              |            |         |  |              |
|      |            |         |  |              |            |         |  |              |

Highlighted cells indicate hydric soils.